

Investment considerations for frozen pension plans

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- The incidence of frozen pension plans, as well as that of closed pension plans, has increased over the last decade as plan sponsors shift the focus of employee retirement benefits from defined benefit plans to defined contribution plans.
- Sponsors of frozen pension plans should be concerned about “trapped capital” as the plans’ funded status improves. Trapped capital occurs when plan sponsors have difficulty utilizing and/or recapturing surplus from the plan. Because of the asymmetric risk profile that occurs, plan sponsors should consider shifting their investment focus from return-seeking to risk mitigation.
- A frozen pension plan will generally require a different approach to managing the investment portfolio, given the additional demand for liquidity to satisfy current benefits, reduced opportunities to “ride out” market volatility due to shrinking time horizons, and the consistent oversight required to manage changing duration levels.
- Finally, frozen pension plans also have many operational considerations that are different from those of open and ongoing pension plans. Issues that affect the plan’s characteristics and ability to be managed in traditional ways—such as negative cash flow, partial liability transfer and, ultimately, plan termination—all contribute toward a need to think about asset allocation in a more dynamic and risk-controlled way.

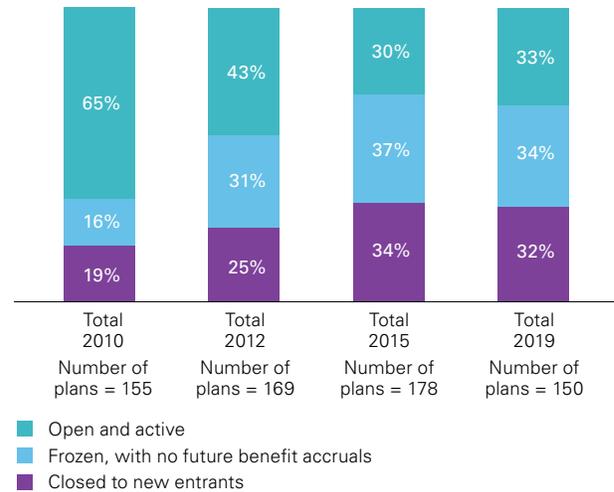
The evolution of plan status

Defined benefit pension plans exist in one of three states: open, closed, or frozen.¹ Open pension plans allow for new employees to become participants upon meeting certain age and service requirements and to accrue benefits with each year of service. Closed pension plans allow for no new participants. However, active participants, as of the date of the plan close, will continue to accrue benefits.² Frozen pension plans allow for no new participants and no future benefit accruals after a specified date.³

Vanguard’s 2019 survey of corporate pension plan sponsors (Dion and Gannon, 2019) found that the proportion of pension plans reported as “open and active,” “closed to new entrants,” and “frozen, with no future benefit accruals” were split nearly evenly, as shown in **Figure 1**.

The survey also notes a trend of sponsors’ closing or freezing a pension plan shortly after the introduction of the Pension Protection Act of 2006, the move to mark-to-market pension accounting, and the 2008 global financial crisis. The percentage of open and active pension plans dropped from 65% to 30% between the 2010 and 2015 surveys as plans adjusted to the new legislation, regulations, and market conditions. However, the percentage of closed and frozen plans leveled off between 2015 and 2019, suggesting that plan sponsors that weathered those changes to the pension landscape may be committed to this form of employee benefit over the long term.⁴

Figure 1. Sponsors’ current pension plan status



Note: Percentages may not total 100 due to rounding.

Source: Vanguard.

Defining funded status goals and trapped capital

The sponsor of a frozen pension plan tends to have well-defined goals—for the asset value to reach the liability value. Further, the liability value for a frozen pension plan is more well-defined and less uncertain than the liability value for an open or closed plan.⁵ When the asset value is equal to the liability value, or maybe slightly above to account for deviations from

¹ Note that variations of the states exist. For instance, a pension plan can close to new employees and allow an exception for only a particular group of participants (for instance, participants over age 50 with more than 15 years of service) to continue to accrue benefits, while other active participants who don’t meet those qualifications would see their benefits frozen as of a certain date. That plan would be considered closed under our definition, as no new employees are allowed to enter the plan but at least some active participants continue to accrue benefits with each year of service.

² Closed pension plans will not be covered directly in this paper; however, they can be thought of on a continuum, moving from an open to frozen status as participants age and terminate from employment. Newly closed pension plans may behave more like open pension plans with high service cost and liability growth, while those closed many years ago would look more like frozen pension plans and adopt many of the strategies discussed here.

³ The Internal Revenue Code prevents qualified pension plans from reducing accrued benefits earned by participants. All benefits earned at the time of a plan freeze are still payable to participants in accordance with the plan document.

⁴ At this time we don’t consider the increase in the percentage of open and active plans from the 2015 survey to the 2019 survey to be a reversal of this trend. This is a small difference that is most likely because of the sample size and specific population in the survey. The 2019 Vanguard survey also explores future changes plan sponsors intend to make, the reasons for the changes, and the top reasons for maintaining a defined benefit pension plan as open and active.

⁵ Pension liability is often thought of as a single value; here, the authors are considering the liability to be a point estimate within a range of values. This point estimate has “error bars” or uncertainty around it. No one knows the true value of the liability, and the actuary must make assumptions for, among other things, interest rates and future salary increases, and decrements such as termination, retirement, and mortality rates. There are many reasonable assumptions that could be made, but only one is chosen for each. The more assumptions, the more unknown those assumptions are; the longer the period over which assumptions must be made, the less certain the point estimate of the liability will be. When it comes to determining liability, a frozen pension plan has fewer assumptions to make and over a shorter time period compared with an open pension plan. Therefore, the liability for a frozen pension plan will be less uncertain than the liability for an open pension plan.

assumptions, the plan sponsor can be reasonably comfortable that it has enough money to pay all future benefits. This can be accomplished by either winding down the pension plan through the payment of benefits when they become due or through a transfer of pension obligations. The transfer could take the form of either the immediate purchase of an annuity from an insurance company or a lump-sum settlement paid directly to a participant or, more likely, a combination of both.

Once frozen pension plans are fully funded, sponsors have little incentive to build a large surplus asset level either through contributions or through an asset allocation focused on high investment returns. After all benefits owed to participants are satisfied, the sponsors may not be able to recapture the full value of any surplus or excess assets. This is often referred to as “stranded surplus” or “trapped capital,” because a sponsor may be exposed to adverse tax consequences if it were to attempt to recapture the excess assets from a terminating plan. The Internal Revenue Code states that any reversion of assets at the time of plan termination (the reversion of assets would equal the excess of assets in the plan over the amount needed to settle the plan’s pension liability) is subject to the plan sponsor’s corporate tax rate plus an excise tax of 50%. Note that certain not-for-profit organizations may not be subject to these tax rules and that the above tax rates may be reduced if the excess assets are used to fund benefits in another qualified pension plan. However, for corporate pension plan sponsors, there are generally limited ways to recapture and use these excess assets.

Dynamic investment policy: The glide path

Because of both the well-defined goal of having the asset value meet or slightly exceed the plan’s liability value and the desire to avoid trapped capital, many plan sponsors have replaced their traditional strategy, which included fixed weights for each asset class, with a “glide path” investment strategy. Much has been written about the theory, adoption, and implementation of a derisking glide-path investment strategy for pension plans,⁶ so we will only summarize:

- Frozen pension plans can benefit from a glide path because of the asymmetric risk related to their pension plans; they don’t fully benefit from excess funding but do suffer from declining funded status.
- The glide path is constructed such that as funded status improves, assets are shifted from the return-seeking allocation to the liability-hedging allocation. This also includes a shift from a growth-oriented strategy (to improve funded status) to a surplus-preservation strategy (to maintain funded status).
- To successfully implement a glide path, the sponsor, or more likely an advisor or investment manager for the pension plan, will need to monitor the funded status of the pension plan.
- Best practices for implementation of a glide path include embedding the glide path in the investment policy statement, implementing allocation changes in a timely and efficient manner, and having safeguards in place to ensure that steps in the glide path are not delayed or overruled by a committee looking to time the markets.⁷

⁶ See Wolfram and Dutton (2018) for further discussion.

⁷ See Bosse, Grim, and Chism (2017) for further discussion.

Negative cash flow

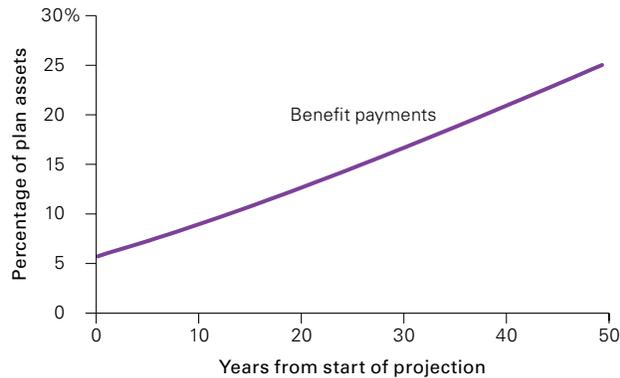
Frozen pension plans, especially those that are well-funded or have no minimum required contributions, are in a state of decumulation, or “negative cash flow.” Negative cash flow is when benefit payments exceed contributions, increasing the chances of asset values declining on a year-over-year basis. This is especially true because benefit payments for frozen plans often increase as a percentage of assets as time progresses, as illustrated in Figure 2. In addition, the payment amounts can exceed the expected rate of return on

those assets, which are likely concentrated in fixed income if the plan is at or near the end of its glide path. Annual declining asset values may sound alarming, but that is the natural state for a frozen pension plan. As the liability value declines because of benefit payments, the asset value declines along with it (theoretically, until they both reach \$0 at the same time, as shown in Figure 3).

Further, the extent to which a plan is in this negative cash-flow situation may be made more unpredictable if the plan has a lump-sum provision and therefore has less ability to forecast the future pattern of annual benefit payments. However, even though having negative cash flows is the natural state for many frozen plans, there can still be complications. Being cash-flow-negative means that a sponsor is a net seller of assets and therefore should be more concerned about liquidity and drawdown risk—both asset-value drawdown and surplus drawdown. A cash-flow-negative state has implications for the plan sponsor’s asset allocation, including:

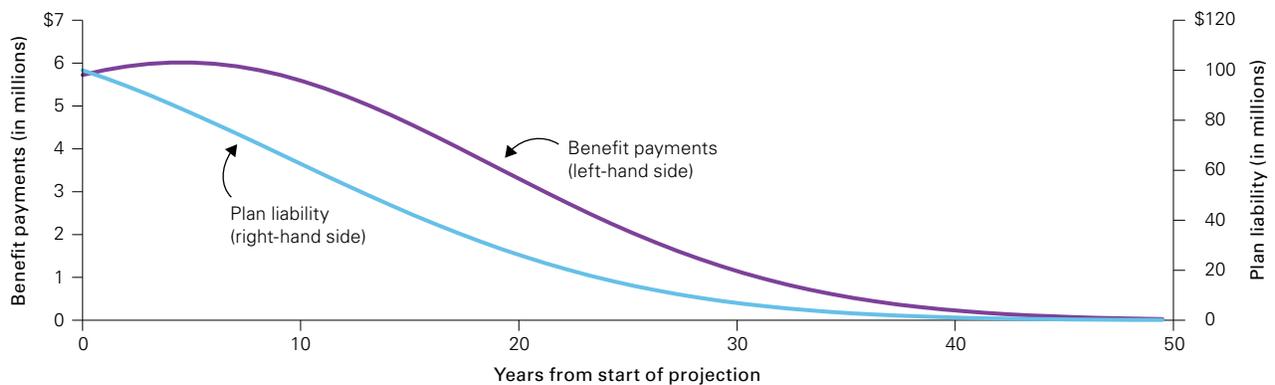
Illiquid assets. Benefit payments must come from the sale of assets, especially for well-funded plans without contribution requirements. To the extent that all asset classes are relatively liquid, assets can be sold in such a way as to maintain the policy portfolio weights.

Figure 2. Projected annual benefit payments as a percentage of plan assets



Source: Vanguard.

Figure 3. Annual projected values of benefit payments and plan liability



Source: Vanguard.

However, to the extent that any asset classes offer only periodic or very limited liquidity, they may not serve as a readily available source of benefit payments, and that would impede the ability to maintain policy weights. This issue may be further magnified when executing a glide-path trigger, if there are difficulties selling illiquid return-seeking assets to fund the purchase of liability-hedging assets.

As such, frozen pension plans with relatively high annual benefit payments may want to limit or avoid certain asset classes or strategies with limited liquidity to escape these issues.

Declining asset values. Negative cash flow leads to declining asset values within each asset class. The return-seeking allocation may decline for two reasons unrelated to market movement: benefit payments and glide-path triggers. With this decline comes the decision about whether or how a plan sponsor should continue to invest in the sub-asset classes of traditionally larger allocations. For example, as the dollars allocated to these sub-asset classes (such as small-capitalization or emerging markets equity) decline, the sponsor is faced with several options:

- Reducing the number of managers within these asset classes because of failure to maintain a manager's minimum asset value requirement, increased fees caused by loss of scale within each manager, or a desire for simplification of the administrative issues of working with a large number of smaller relationships.
- Pursuing a passive strategy to maintain market exposure and diversification. Reducing the number of active managers may, inadvertently, increase the concentration risk for a given strategy, thereby reducing diversification.
- Combining the sub-asset class into the broader asset class, such as combining small-cap U.S. equity with large-cap U.S. equity into an all-cap allocation to maintain exposure and any total portfolio diversification benefits.

Decreasing time horizon. An investor's time horizon is the length of time they intend to keep their asset portfolio invested in its current manner. Therefore, declining asset values also decrease the plan's investment time horizon. Frozen pension plans naturally decrease their investment horizon for all asset classes as their asset values decline, and more so for return-seeking assets when glide-path triggers are in place.

This is important because many investment strategies require a full market cycle (generally five to seven years) to be considered successful or to at least realize a premium attributable to the risks they take. This applies to active managers that specialize in security selection or use tactical strategies within a portfolio that may overweight a specific market segment, such as large-cap equity relative to small-cap or domestic securities relative to international.⁸ Successfully implementing these types of investment decisions on a consistent basis has proven difficult, and trying to make those same decisions (especially tactical shifts) with a declining time horizon would likely be even harder.⁹ Many plan sponsors faced with this decision may determine that it's not a prudent use of their resources and instead decide on a passive investment approach for that particular asset class to achieve market exposure and portfolio diversification.

Greater sensitivity to market downturns. Long-term buy-and-hold investors have the ability to "stay the course" after a market downturn and be patient while allowing asset values to recover. However, pension plans are "forced sellers" of assets and might need to sell to satisfy benefit payments in a down market. Net sellers of assets will have reduced asset levels after a market decline, and even less after they make required benefit payments. This will give them a lower asset base with which to participate in any market recovery, and the longer it takes the market to recover, the more important the lower asset base becomes because additional benefits will need to be paid. All else equal, two frozen pension plans may have different allocations to return-seeking assets based on their planned level of benefit payments; the plan with the higher level of benefit payments or with the lump-sum provision should be taking on less risk in its asset portfolio.

⁸ See Rowley, Walker, and Zhu (2019) for further discussion.

⁹ See McCullough (2019) for further discussion.

Duration drift

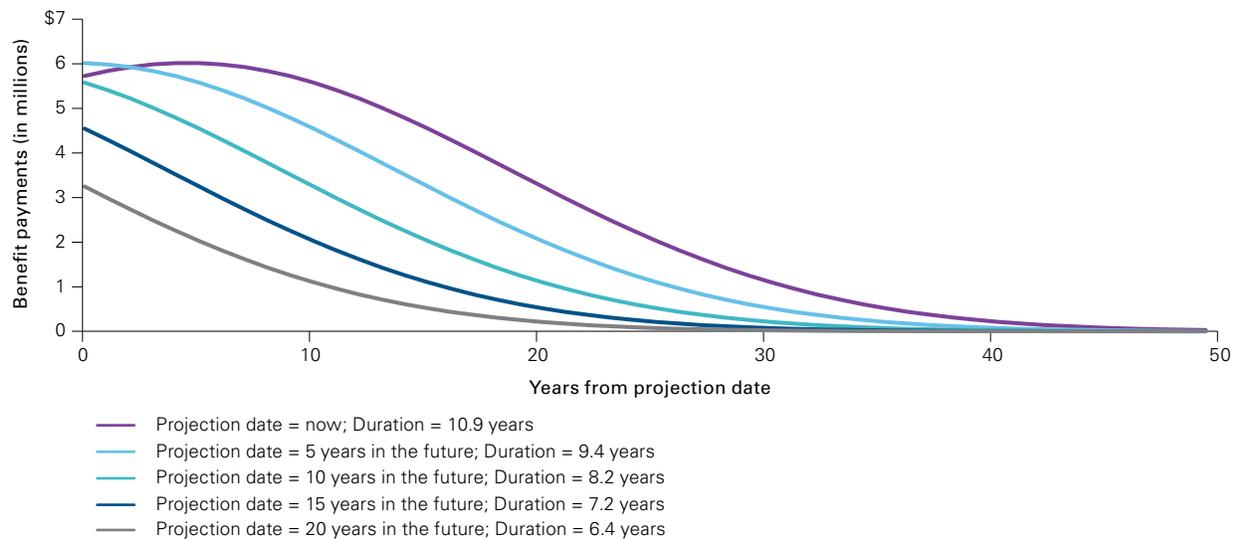
Many pension plan sponsors have constructed their liability-driven fixed income strategy based on the duration of the plan's pension liability. Liability duration is a good measure of the interest rate risk embedded in a pension plan and, to the extent that the fixed income portfolio aligns with the interest rate risk, the plan's surplus will be less exposed to interest rate movements. For open pension plans, the duration value is not expected to change markedly year to year. Two key levers that impact the duration for open plans are the benefits paid out and the benefits earned. The duration will decline as benefits are paid but will then increase as new benefits are earned by participants. These effects tend to cancel each other out and lead to open plans' having a relatively constant duration for the plan liability.

This is not the case for frozen pension plans. As benefits are paid out, the liability duration decreases, and there are no new benefits being earned to offset that change in duration. Liability duration, and therefore interest rate sensitivity, will decline each year for a frozen pension plan.¹⁰ As shown in Figure 4, the sample pension plan's duration decreases from the initial point of 10.9 years to

9.4 after 5 years, 8.2 after 10 years, and eventually 6.4 after 20 years. Because a frozen pension plan's cash flows are relatively easy to estimate, this declining duration is quite predictable.

Now that we know that the plan's duration decreases each year, we can start to consider how we will set up the plan's liability-hedging strategy in the future. The plan sponsor will need the asset manager to reduce fixed income duration each year to match the changes in the liability duration. This might mean that, over time, assets in long-duration bonds will shift to intermediate-duration bonds. Although the movement may be slow and the magnitude uncertain, the direction is predictable; each benefit payment and passing year causes the duration of the liability to shorten, all else equal. This should be recognized in the liability-hedging program. Vanguard believes that, in the continued evolution of the liability-hedging allocation, a combination of investments with defined weights should give way to specified hedging ratios or duration levels relative to the liability. This will allow the manager to recognize the change in duration in the liability-hedging strategy without the possible delay caused by having to approve an asset allocation change or amend an investment policy statement.

Figure 4. Annual projected benefit payments at specified future periods



Source: Vanguard.

Hibernation, termination, and in between

Once a plan closes to new participants or freezes accruing benefits altogether, it has started down the road toward eventual termination;¹¹ the sponsor will no longer maintain a pension plan and will transfer its entire pension liability to either the participants (through lump-sum payments) or to insurance companies (through an annuity purchase).¹²

Frozen pension plans should, with some regularity, analyze the decision and trade-offs between hibernation and immediate termination.

We define hibernation as the act of managing a frozen pension plan using a low-risk approach until the time of the plan termination. The beginning of the hibernation phase could occur at many different points on the frozen plan's journey but generally starts after a higher funded status is achieved, such as 95% to 100%. While an extensive review of the hibernation discussion could require a separate research paper,¹³ the key attributes of the hibernation stage of pension plan management include:

- A heightened focus on minimizing the costs of the pension plan, both implicit and explicit.
- A high allocation to liability-matching fixed income to increase the correlations between asset and liability returns.
- Allocations to liquid assets that can be readily redeemed to pay benefits and, possibly, used to help facilitate an annuity purchase (through an in-kind transfer) in a future termination.

The decision to hibernate rather than terminate a pension plan can be made for several reasons: (1) the plan is underfunded and the sponsor cannot afford the contribution necessary to fund a plan termination,¹⁴ (2) the plan is fully funded but the sponsor believes

that the plan termination premium is too high and that it can run the pension plan at a lower cost, (3) the sponsor believes that continuing to operate the plan and paying benefits will reduce both plan size and the required costs to terminate in the future, or (4) other financial reasons (for instance, avoiding the recognition of settlement accounting) or even nonfinancial reasons (for example, the sponsor may wish to maintain contact with the retired participants due to a strong sense of obligation toward them or the community in which the sponsor operates).

Further, hibernation versus termination is not an all-or-nothing decision. Many plan sponsors continue to participate in staged liability transfers where portions of the liability are settled to decrease the size of the pension plan until the termination decision is finalized. Staged liability transfers can be attractive because each step can be executed even if the plan is not fully funded, whereas a full plan termination requires the plan to be fully funded. Staged liability transfers may include such steps as:

- A voluntary lump-sum offer for terminated vested participants.
- Purchasing annuities for retirees (or terminated vested participants) whose monthly benefits are less than a certain dollar amount.
- Large-scale retiree annuitization where all, or nearly all, retiree liability is annuitized with an insurance company.

Any of these decisions will cause the plan to encounter some of the issues discussed earlier in this paper, such as further declining asset values or a substantial shift in the plan's duration. Therefore, investment strategy considerations should be planned in advance of any liability transfer activity.

¹¹ Plan termination is a very specific act where all benefits are paid from the plan, either directly to the participant in the form of the lump sum or by purchasing an annuity for the participants from an insurance company. After these steps, the pension plan ceases to exist. The entire plan termination process is tightly regulated by the IRS, and the period from deciding to perform the plan termination to the final windup of the pension plan can be a lengthy administrative process that requires many steps (including data cleanup, participant notices, filing a government form, a lump-sum program and payment, searches for missing participants, and negotiation and purchase of annuities) that may take upwards of 18 to 24 months. The considerations and full explanation of a plan termination are beyond the scope of this paper.

¹² The other choice would be to continue to operate the pension plan under its current form until the last check has been paid to the last remaining participant many decades from now. We don't believe that this last option is very likely, as eventually the plan will become too small to justify the necessary and relatively high administrative requirements and costs.

¹³ See Inglis and Zahm (2014) for further discussion.

¹⁴ Note that although prices may vary, insurance companies usually require more than \$1 of assets to cover \$1 of liability in an annuitization transaction. This excess amount, known as the premium, is representative of the insurance company's placing a different value on the liability (usually different mortality tables or assumptions around elections of future forms of benefits) and the up-front inclusion of its costs and risk of managing the assets and paying the benefits for all remaining participants for their life span.

Conclusion

As illustrated above, the act of closing or freezing a pension plan does not, in itself, remove complexity from the management of the plan. Rather, these plan decisions require close examination of key metrics of the pension, such as liquidity needs, time horizon, and duration management. Although these are key areas for plans at any stage of their life cycle, the emphasis truly shifts once a plan closes to new entrants or freezes to new benefit accruals. Because of the plan's changing needs and time horizon, substantial allocations to investment strategies that involve illiquidity or require full business cycles for proper evaluation may no longer be suitable.

Frozen pension plans present a changing set of risks to be managed, as evidenced by the new set of challenges created such as stranded surplus and negative cash flow. It is our view that the plan sponsor and/or its advisers should be experienced in all phases of pension plan management, as the objectives and definition of success change during each phase. Preparing for the end-state asset portfolio (as noted in Wolfram and Dutton, 2018) is also a vital best practice that requires specialized planning when the decision is made to maintain and manage a frozen pension plan. Finally, liability transfer becomes a frequent consideration as the plan enters a phase where hibernation and termination emerge as key choices for the pension committee. The adviser, consultant, or outsourced chief investment officer (OCIO) should be familiar with how each of these strategies is executed and how to manage and control the shifting risk profile on a post-liability-transfer basis.

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